

Clearwing Swallowtail

Cressida cressida

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PLANNING AND ORGANIZING COMMITTEE 2018

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PLANNING AND ORGANIZATION MEETINGS

A quarterly meeting is scheduled in order to plan club activities and the magazine.
See BOIC Programme.

CONTACT ADDRESS AND MEMBERSHIP DETAILS

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Membership fees are \$30 for individuals, schools, and organizations.

AIMS OF THE ORGANIZATION

- To establish a network of people growing butterfly host plants;
- To hold information meetings about invertebrates;
- To organize excursions around the theme of invertebrates e.g. butterflies, native bees, ants, dragonflies, beetles, freshwater habitats, and others;
- To promote the conservation of the invertebrate habitat;
- To promote the keeping of invertebrates as alternative pets;
- To promote research into invertebrates;
- To encourage the construction of invertebrate friendly habitats in urban areas.

MAGAZINE DEADLINES

If you wish to submit an item for publication the following deadlines apply:

March issue – February 1st

June issue – May 1st

September issue – August 1st

December issue – November 1st

All articles should be submitted directly to the Editor daphne.bowden1@bigpond.com

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COVER PAINTING

Clearwing Swallowtail, *Cressida cressida* – Painting by Lois Hughes



FROM THE PRESIDENT

I am sure that many of you will have enjoyed the excellent and informative article on mimicry written by John Moss as the cover story of the September edition of our magazine. Thank you to those who have conveyed your appreciation to us.

A great deal of focus in the magazine is concentrated on articles about butterflies and this is understandable because of their high visibility and the universal love of butterflies. John and Wesley have once again made a great contribution for our cover story and another of Lois's paintings graces our cover. Thank you all.

My oft repeated request is here again – without your support our magazine would be much poorer. Please send us your thoughts, snippets of interest, reports on local activities, images etc. These do not have to be technical in nature and will be most welcome.

You will find details of planned club activities listed in the latter pages of this edition and I encourage you to participate in these activities if you are able to get to them.

Best wishes for Christmas and the coming New Year.

Ross

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CREATURE FEATURE

Life history, distribution & behavioural notes on the Clearwing Swallowtail, *Cressida cressida* (Fabricius, 1775) Lepidoptera: Papilionidae - Wesley Jenkinson & John T. Moss



This is a well known but not generally common butterfly, previously (and colloquially!) known as the “Big Greasy”, due to the females’ (mostly) scaleless wings having the appearance and feel of grease-proof paper! [Presumably the smaller, unrelated Glasswing is/was the “Little Greasy”]

It has been recorded in Queensland from Cape York south to central coastal New South Wales, the “Top End” of the Northern Territory, as well as disjunct occurrences in the Kimberley region west to Broome in Western Australia. There is an uncommon subspecies in Papua-New Guinea (*C. c. troilus*) which occurs in lowland open forest and savannah country (Parsons, 1998).

In southeastern Queensland the species is chiefly known from coastal and subcoastal regions as well as areas west of the Great Dividing Range. Some disjunct inland vagrant records are also known from Queensland and New South Wales. Adults utilise a varied range of habitats including woodland, open eucalypt forest and dry vine scrub and can be locally common where the host vines are growing. They may also be found locally in suburban gardens where host vines have been established.

In flight adult males of *C. cressida* could be confused with the Dainty Swallowtail *Papilio (Eleppone) anactus*, although *C. cressida* are generally larger and have a slightly different flight pattern. In respect to general pattern and markings, *C. cressida* has a clear forewing with two large black spots in the cell but *P. anactus* has a grey forewing with a single black spot in the cell. Also *P. anactus* has the subterminal spots on the hindwing an orange-red rather than pinkish red and they are disjunct rather than a continuous semi-circle pattern. *C. cressida* also has a pink and black abdomen, rather than yellow and black as with *P. anactus*. John (Moss, 2018) concluded that this similarity is a clear example of mimicry, with the presumably bland *P. anactus* gaining some protection by its resemblance to the presumably distasteful *C. cressida*. [Note: Both these species as well as the similar-looking female



Orchard Swallowtail are illustrated for comparison on page 13 of the previous issue (#90) of this magazine.]

In this species, individual adult specimens show considerable variation in size with the females on average being smaller than the males. This was noted in Braby, 2000 and Dunn and Dunn, 1991 who both considered a NT subspecies "cassandra" to fall within this variation and relegated it to a local form only. Within Queensland, the adults show only very limited variation in the size of the pinkish spots on the underside of the male hindwing and the extent of the brown suffusion of the female wings. Sexes are dimorphic (see photos) so are quite easy to separate. During mating the male secretes a substance that forms a hard plug (sphragis) which blocks the opening of the female receptive organ; thus restricting future mating with other males.



Cressida cressida (Clearwing Swallowtail)

Images top left to right: male, female Images lower left to right: male underside, female

Wingspans for the pictured adult specimens are males 85mm and females 80mm respectively.

Known host plants include several native *Aristolochia* species (Aristolochiaceae), in particular: *A. meridionalis* in Southeast Queensland and northern NSW, *A. pubera* in



Central Queensland, *A. acuminata* & *A. thozetii* in North Queensland and *A. holtzei* in the Northern Territory.

Females will readily oviposit on the exotic South American species *A. elegans* (Dutchman's Pipe) but this species is known to be toxic for *Cressida* as well as Birdwing (*Ornithoptera*) larvae. R. Manski reported that some larvae survived by feeding on flowers of this species (Braby, 2000).



Female ovipositing on Dutchman's Pipevine
A. elegans

During December 2005 a female was observed laying eggs on *A. elegans* near Rathdowney in South-eastern Queensland. She fluttered slowly around the host vines close to the ground and then settled on a young fresh leaf. The abdomen was curled below the leaf then a single egg was laid. While ovipositing the wings remained open and stationary. This process was

repeated several times and the eggs were collected and successfully raised to adults on cultivated Tagala Vine, *Aristolochia acuminata*.

Egg - Size 1.0 mm, pale orange or orange, spherical, 16 slightly raised longitudinal ribs.



1st instar larva



2nd instar larva



3rd instar larva



4th instar larva



5th instar larva

In captivity first instar larvae consumed their eggshells soon after emergence and later commenced chewing small sections from the outer edge of the leaves. Larvae were found resting openly on a fine silk pad either on the upper or lower side of leaves and fed during the day and occasionally at night. Larger larvae also rested along stems of the host plant. As a defence mechanism the larvae have a strongly pungent-scented,



orange-coloured, fleshy osmeterium that they protrude from behind the head to deter predators when disturbed. Larvae completed five instars and attained a length of up to 40 mm.

Larvae show interesting colour variation as pictured below.



3rd instar larva



5th instar larva (pale form)



5th instar larva (intermediate form)



5th instar larva (dark form)



Pupa

A pupa, measuring 28 mm in length, was located on the underside of a branch supplied to pupate on. The pupa was attached by the cremaster and a central silken girdle.

Wes has located pupae attached to objects such as plant stems and tree branches up to 20 metres away from the host plant.

For many years while growing cultivated *A. acuminata* (a Northern Queensland species, formerly

A. tagala) at Wes's parents' residence in Beaudesert, the butterfly was not present until small larvae were introduced onto the vine. After this introduction several adults began to appear and females proceeded to lay eggs on young vines growing near the base of the main vine. After most of the small vines had eggs present the females oviposited higher up on the main vines up to around 2 metres high. Some individual leaves had up to 5 eggs present. Since this introduction approximately 10 years ago,



this species has become resident with some individual adults remaining locally for up to a week or more.

The total time from eggs laid [29/12/2005] to an adult emerging [09/02/2006] was just under 1.5 months, with egg duration 5 days, larval duration 21 days and pupal duration 16 days.

Within the new boundary of the Scenic Rim Regional Shire south of Brisbane, Wes has records of adults on the wing in all months with the exception of July. There are probably 3 or 4 generations per year in this region.

Acknowledgments:

All photos by Wes Jenkinson.

We would like to thank Lois Hughes for her lovely cover painting of the species.

References:

- Braby, M.F., 2000. *Butterflies of Australia – their identification, biology and distribution*. vol 1. CSIRO Publishing, Melbourne.
- Dunn, K.L. & Dunn, L.E. 1991. *Review of Australian Butterflies: distribution, life history and taxonomy*. Part 1. Privately published, Melbourne.
- Moss, J.T.StL., 2018. Notes on mimicry, especially in relation to butterflies and moths, with special reference to the Dainty Swallowtail *Papilio (Eleppone) anactus* (W.S. Macleay, 1826). *Metamorphosis Australia* **90**: 4-19.
- Parsons, M., 1998. *The Butterflies of Papua New Guinea: Their Systematics and Biology*. Academic Press, London.

ITEMS OF INTEREST

An Encounter with *Pieris rapae* – the Cabbage White – Peter Hendry

On the 21-06-2018 I stepped onto the wharf of the city of Gdynia, Poland and almost immediately noticed the fluttering of little white wings. Excited at the prospect of photographing and identifying some, new to me, exotic species, I made my way along a tall chain wire fence, at the base of which grew several species of wildflowers, including one I recognized as a species of *Convolvulus*. Here there were dozens of these white butterflies nectaring. Apart from visits to butterfly houses, these were the most butterflies I have seen in a foreign country.



Fig.1 *Pieris rapae* (Linnaeus, 1758), Poland



Fig. 2 *Pieris rapae* (Linnaeus, 1758), Poland

After capturing my first image (Fig. 1), the bad news set in. I was looking at the pest species *Pieris rapae*, nothing new or over-exciting though I do enjoy seeing butterflies of any species in numbers. As I walked the streets of Gdynia I saw many more and, in particular, on a vacant block, overgrown with weeds and wildflowers, there were dozens of them nectaring (Fig. 2). They were even feeding where the sun filtered into the woods at the base of the lookout point, Kamienna Góra, though there were only a few on top of the lookout and no sign of any hill-topping. Though they were in numbers, it was nothing like the Caper White migrations I have seen in South East Queensland.

Speaking of migration, the Cabbage White is one of only three butterflies to immigrate to Australia. The first was the Monarch, *Danaus plexippus*, in 1871 and in more recent times the Tawny Coster, *Acraea terpsicore*, in 2012. Unlike the Cabbage White, these two earned their stripes by flying in. The Cabbage White, being rather lazy or smart (a fine line), relied upon we humans and travelled with us to several countries of the world as eggs, larva or pupa, on a food source consumed by us and itself, plants in the family Brassicaceae. The first Australian record was a specimen reared in Melbourne in 1929 by G. Lyell and was recorded by Dunn and Dunn in 1991 in their four-part series, *Review of Australian Butterflies: distribution, life history and taxonomy*.

Photos Peter Hendry

A selection of flower feeding beetles – Richard Zietek

The following are a few examples of flower feeding beetles. Most of the Cetoniids I have encountered can be successfully cultured on decomposed hardwood mulch but unless a source of decomposed material is available numbers bred this way can be small. Most larvae take 12 months to mature to adults but in adverse conditions, these same grubs can survive up to 3 years before pupating and emerging as adults.





Schizorhina immaculata

Natural size approx. 20 mm.

Found in North Queensland from December-January, high flying on bloodwoods and various rainforest trees. In flight, looks like a large bee.
Photo F. Walsh



Themognatha variabilis

Natural size approx. 32mm.

Widespread from Sydney to North Queensland, found on blossoms particularly *Angophora* sp. and certain *Eucalyptus* sp. Flies mainly in December on hot sunny days.

Photo Hongming Kan



Glycyphana papua

Natural size approx. 12mm.

Flies in North Western Queensland in late January. Is attracted to flowering *Eucalyptus* sp.. Not common. Large family with many similar looking species.

Photo F. Walsh



Trichaulax philipsii

Natural size approx. 22mm.

Widespread from Victoria to North Queensland. Not common. Flies very high to top of eucalypt blossoms in late December/early January. Breeds in hollow limbs of eucalypts.

Photo R. Zietek





Dilochrosis atripennis

Natural size approx. 28mm.

Widespread species from Victoria to North Queensland. Attracted to blossoms of many native trees and fruit, particularly figs, where it is a pest in the fruit growing areas of the Vic-NSW border. A number of color forms are found.

Photo Hongming Kan



Trichaulax concinna

Natural size approx. 16mm.

Distribution North Western Queensland. Uncommon. Dependent on rain for emergence from pupal case. Attracted to *Eucalyptus* sp. blossoms.

Photo R. Zietek

Life history notes on the Small Dusky-blue, *Candalides erinus* (Fabricius, 1775) Lepidoptera: Lycaenidae – Wesley Jenkinson



This small species known as the Small Dusky-blue butterfly has been recorded from north-eastern Queensland south to central coastal New South Wales. Within Australia, it is also known from the Northern Territory and Western Australia. The species is chiefly allied with coastal and sub-coastal regions including sections of the Great Dividing Range. The nominate subspecies only occurs in Australia, although 6 other subspecies have been described from islands to the north.

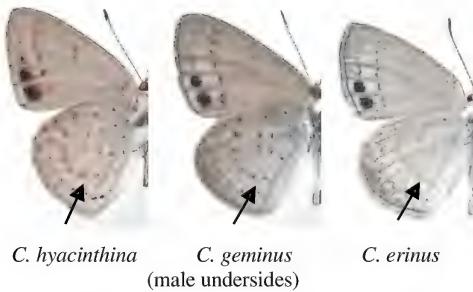
Adults can be located in a wide variety of open habitats including coastal wallum and montane heathland, various types of woodland and eucalypt forest. They can be locally common on coastal headlands and elevated foothills and ridges where the host vines are well established.



Both sexes are quite slow fliers but can fly quickly if disturbed. They typically bask on grass stems and other low vegetation with their wings open facing towards the sun. Adults feed on small native and exotic flowers, males can also be located hilltopping.

Adults can be confused with two other species in the same genus, being the Varied Dusky-blue (*C. hyacinthina*) and the Twin Dusky-blue (*C. geminus*). In comparison, *C. erinus* is smaller in size and has a lighter grey ground colour on the underside. As indicated with the arrows the postmedian markings on the hindwing underside between veins M2 and 1A+2A form a straight line in this species. The markings on

the other two species form a slight curve (Braby, 2000). *C. erinus* can also be easily confused with the Common Grass-blue (*Zizina otis*, formerly *Z. labradorus*) when they are flying together.



Sexes can be separated with the males being a lilac bronze colour on the upperside of the wings and females being greyish black when fresh.

Wingspans for the pictured large sized males and females are both 25mm.



In Australia, hostplants are Dodder Laurel vines (*Cassytha* species, Lauraceae), the most commonly used being *C. filiformis* (Smales & Ledward, 1943 and Braby, 2016), although *C. pubescens* is used in north-east Qld (Braby, 1997). Braby (2016) also lists *C. capillaris* in northern WA and *C. aurea* in the NT.

During early March 2018, a female was observed ovipositing on flower buds and fresh stems of host plant Common Dodder (*Cassytha filiformis*). She typically fluttered slowly amongst grass stems on which the host vines were growing over and settled on a flower bud. Her abdomen was then curled around the base and a single egg was laid. Several more eggs were laid singly within a few minutes and her wings were closed during ovipositing. This observation was during early afternoon in hot cloudy conditions. Several eggs were collected and successfully raised in captivity.



The tiny eggs were approximately 0.4 mm high x 0.6 mm wide, pale green, mandarin shaped with deep round shaped pits.



Freshly laid egg

1st instar larva

2nd instar larva

3rd instar larva



4th instar larva

5th instar (dorsal view)



5th instar (lateral view)

Pre-pupa

Emerging larvae which were raised in captivity consumed only the top section of the eggshell. The young, very well camouflaged larvae rested and fed on fresh flower buds and fresh shoots while the older larvae chiefly feed on the stems of the host plant. Several dead leaves were placed around the host vine to provide shelter, however the larvae remained on the stems until pupation. The main feeding period appeared to be from dusk throughout the night with limited feeding observed during the day.

Larvae completed five instars and attained a length of 16 mm. In natural conditions, the larvae are occasionally attended by ants (Braby, 2000). In captivity, the larvae were successfully raised without attendant ants.



Pupa dorsal view

Pupa lateral view



Pupae, measuring 12 mm in length, were either located on a dead leaf or on the side of the container where they were raised. They were attached with silk by the cremaster and a central girdle to a light pad of silk.

The total time from egg to the first adult was over 1 month, with egg duration 5 days, larval duration 18 days and pupal duration being 10 days. The final adult emerged 3 days after the first. Two adults were observed emerging late in the afternoon.

Within the boundary of the new Scenic Rim Regional Shire south of Brisbane, I have adult records from October to December and from February to May. There are at least two or more generations per year in this location.



Acknowledgements: I would like to thank John Moss for commenting on the manuscript.

Photos Wesley Jenkinson

References:

- Braby, M.F., 1997. New larval food plants for some butterflies from northern and central Queensland, Australia. *Australian Entomologist* **24**: 97-108.
- Braby, M.F., 2000. *Butterflies of Australia – Their Identification, Biology and Distribution*. Vol 2. CSIRO Publishing, Melbourne.
- Braby, M.F., 2016. *The Complete Field Guide to Butterflies of Australia*. 2nd edn. CSIRO Publishing, Clayton South, Vic.
- Smales, M. and Ledward, C.P., 1943. Notes on the life histories of some lycaenid butterflies Part 2. *The Queensland Naturalist* **12**: 47-52.

Mistletoe Profile – extract from The Mistletoes of Sub-tropical Queensland, New South Wales and Victoria by John T. Moss and Ross Kendall

Gum-leaved or Creeping Mistletoe *Muellerina eucalyptoides*

Description

Unlike other species of *Muellerina*, this mistletoe is pendulous in habit, which is appropriate to its position, often high up on eucalypt or angophora trees. As with the other *Muellerina* species, it has long epicortical runners.



As the name suggests, its leaves are shaped like



those of its hosts and can be up to 25 cm long, with a relatively long petiole (1 to 3 cm). The opposite leaves have red petioles, mid-veins and margins. Each reddish branchlet terminates in a pair of leaves.

The tubular flowers are green on the outside with the inside of the petals bright red. They are borne on reddish peduncles off the central axis of a terminal raceme, as three groups of opposite pairs, in decussate arrangement.

The 1 to 2 cm long pear-shaped fruit is pale yellow with some fruit showing a slight bend about the middle.

Habitat and Host Plants

This mistletoe is usually found in tall open forest, at elevation, especially along the Great Dividing

Range, plateaux and adjacent upper slopes. It is often on acacias, but mostly associated with eucalypts, especially River Red Gum (*Eucalyptus camaldulensis*), Forest Red Gum (*Eucalyptus tereticornis*), Sydney Blue Gum (*Eucalyptus saligna*), Flooded Gum (*Eucalyptus grandis*) and including bloodwoods, stringybarks, ironbarks, half-barks especially Blackbutt (*Eucalyptus pilularis*) and New England Blackbutt (*Eucalyptus campanulata*), and on smooth and rough barked apple gums, in particular *Angophora subvelutina*. It also utilizes many exotics, especially in fruit growing areas where it appears to hybridise with *Muellerina celastroides*.

Butterflies and Moths

- Imperial Jezebel (*Delias harpalyce*)
- Black or Common Jezebel (*Delias nigrina*)
- Dark Purple Azure (*Ogyris abrota*)
- Southern Purple Azure (*Ogyris genoveva*)
- Golden or Sydney Azure (*Ogyris ianthis*)
- Mistletoe Emperor Moth (*Opodiphthera loranthi*)
- Mistletoe Day Moth (*Comocrus behri*)

Notes

Barlow (1984) recorded this species from Mt Gambier in South Australia along the coast, ranges and slopes to Kingaroy in southern Queensland.

Since that time it has been found much further north in disjunct populations at: Kroombit Tops (south-west of Gladstone) on *Eucalyptus grandis* [J. Moss & W. Jenkinson, April 2011]; Eungella (west of Mackay) also on

Eucalyptus grandis [M. Braby, 9th April 1992] and on *Corymbia intermedia* [A. Bean, 19th February 2003]; and more recently near Ingham on an unspecified eucalypt [K. Dunn, 9th May 2015]. A record of the Dark Purple Azure butterfly (*Ogyris abrota*) further north at Herberton [G. Wood, 1992] suggests that the (usual host) mistletoe may also occur there.



The growth form of *Muellerina eucalyptoides* is unusual in as much as the attachment is often on the exposed vertical trunk or undersides of larger branches. In 2014, John, in company with Margaret Greenway, studied a plant growing on the trunk of a large Scribbly Gum (*Eucalyptus racemosa*) in montane heath at Mt Mee north-west of Brisbane. There was a line of multiple attachments with tiny haustoria but the presumed intervening epicortical runners had involuted in all but one position. It is suggested that its alternative common name "Creeping Mistletoe" may have been coined to reflect this spreading multiple attachment phenomenon.



Muellerina eucalyptoides with multiple haustoria – Photo John Moss





Muellerina eucalyptoides plant



Muellerina eucalyptoides foliage



Muellerina eucalyptoides flowers and buds

Photos Ross Kendall



Muellerina eucalyptoides fruit



UNDER THE MICROSCOPE



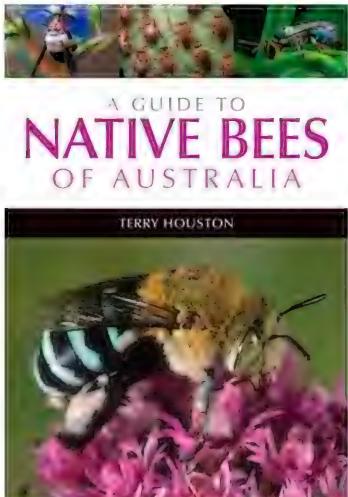
Are you able to identify this image?

See page 26 for the answer.

Photo Trevor Lambkin

BOOK REVIEW

"A Guide to Native Bees of Australia" by Terry Houston from CSIRO Publishing, 2018 – Reviewed by *Tim Heard*



Terry Houston's new book on Australia's native bees is a masterpiece. Only a specialist who has spent a lifetime working on a topic could have written such an insightful and comprehensive tome. Indeed Dr. Houston has studied Australian native bees for more than 50 years, both in the field and in state museum collections. He served as Curator of Insects at the Western Australian Museum for 34 years, where he continues his bee research in an honorary capacity.

The book is divided into two parts: the first 85 pages are an "Overview of bees and their biology" with the remaining 163 pages comprising: "The identification of bees".

Part I "Overview of bees and their biology" makes for a fascinating read. This is excellent natural history writing and covers topics such as life-cycles, nesting, parasitic bees, sociality, male behaviour, colour and mimicry, and relationships with plants and natural enemies. These sections lay bare the diverse and unique features of Australia's rich bee fauna. Did you know that males of one north Queensland species spend the night on the surface of a broad leaf on which they space themselves evenly and facing the same direction? See the front cover of this book for an arresting image of this astonishing behaviour.

The section on Form and Function is comprehensive without getting too bogged down in detail. It provides all that is needed, but no more, to use the taxonomic keys presented later. The structures are illustrated with superb images. The section on Origin and Evolution is short and sidesteps the difficult and unresolved questions of



bee phylogeny. Unfortunately, no phylogenetic tree is presented although this is understandable given the uncertainties.

Part II “The identification of bees” is the functional part of the book which committed readers with a microscope can use to identify their bees using a series of dichotomous keys. This book will not permit the user to identify the estimated 2,000 species of Australian bees but will get you to genus, of which there are 58 on our shores. I was surprised that a list of genera is not presented; I would have appreciated seeing such a list arranged under families, subfamilies and tribes.

The first step in identifying a bee is to determine the family to which it belongs. Interestingly, Dr. Houston has not provided a standard dichotomous key to family. The author explains that some characters may be hard to see especially in dry pinned specimens and so the table offers options. Once the user has determined the family to which their specimen belongs, they will find keys to subfamilies within family and tribes within subfamily and genera within tribe, all neatly arranged. Accompanying the keys are excellent accounts of each family, subfamily, tribe and genus. Houston’s book fits very nicely with another recently-published book, “The Australian Bee Genera: An Annotated and User-Friendly Key” by Tobias Smith. Smith’s keys are a delight to use as each couplet is fully illustrated right there on the same page. In the case of Houston’s book, the less experienced user might be frustrated by having to frequently refer to other pages to find illustrations or the characters might not be illustrated at all. Smith’s book, however, is only an identification tool while Houston’s contribution gifts the reader a wealth of further information. These two books should become inseparable friends on your bookshelf or beside your microscope.

With regard to identification of species, that is beyond the scope of any current book. You will still have to go to the scientific literature to achieve that. That is an almost impossible task for anyone who has not got institutional access to the journals. In addition, access to a reference collection and formal training in taxonomy is needed. Furthermore, many species are undescribed, or not separable using keys. Even for the described species keys may not be written. Much work remains to be done, a challenge to future generations. Currently, only a handful of specialists in this country have the skills and resources to identify bees to species. I await with anticipation for an online lucid style key, at least to genera. This will truly democratise the identification of bees, making it easier and more reliable.

Terry Houston’s “A Guide to Native Bees of Australia” is available in Paperback for AU\$50 and also available as an eBook. The book is small format at 215 x 148 mm and I feel it would be easier to read if the text was a little bigger, plus its “wow factor” would be enhanced if images were larger. The references to the literature are patchy. There is an excellent bibliography section but generally, the information presented through the book is not referenced. Similarly, the figures at the beginning of the book (up to page 15) are numbered with captions, but after that appear without



numbering. The cover features an attractive photo of a blue-banded bee, a good choice as this is probably Australia's best known and loved bee. This book will appeal to professional and amateur entomologists and natural history enthusiasts.

A summary of recent books on Australian Native Bees

Australian native bee writing has been buzzing with activity recently producing a veritable swarm of new books to delight readers. As luck would have it, these books complement each other beautifully. Houston's book is a landmark contribution but is not for those wishing to learn how to encourage, nurture or keep native bees. Fortunately, those topics are already well covered in other recent books.



“A Guide to Native Bees of Australia” 2018, by Terry Houston, 272 pages, \$50. A comprehensive description of the broad diversity of Australian Native Bees.

“The Australian Bee Genera: An Annotated and User-Friendly Key”. 2018, by Tobias Smith, 108 pages, \$FREE PDF available for download from the Bee Aware Brisbane website. A well-illustrated identification tool, a perfect match to Houston's book.



“Bees of Australia”, 2018, by James Dorey, 206 pages, \$50. A gorgeous photographic exploration of more than 70 native bee species.

“The Contented Bee” 2018, by Organic Gardener Magazine, 304 pages, \$35. An inspirational handbook, the focus is on exotic honey bees but includes advice and stories on native bees too.

“The Australian Native Bee Book: Keeping stingless bee hives for pets, pollination and sugarbag honey”, 2016, by Tim Heard, 264 pages, \$35. Focuses on native social bees.

“AgGuide A Practical Handbook: Australian native Bees” 2016, by multiple authors, 174 pages, \$35. A guide to observing and keeping Australia's broad range of native bee species.

Field Guide to the Butterflies of Sri Lanka. George Michael van der Poorten & Nancy E. van der Poorten. Lepodon Books 2018. ISBN: 978-1-77136-605-2. Paperback 250pp. + vi; US \$28; AUS ~\$40

Reviewed by *Kelvyn Dunn*

Field Guide to the Butterflies

of
Sri Lanka



An up-to-date field guide to help identify all of the butterflies of Sri Lanka is a welcome piece for visiting naturalists and for those residents of the nation who wish to recognise and learn about their local fauna. There have been a few changes to the butterfly knowledge since the last work of this kind came out in 2013 – a handbook by Rajika Gamage that illustrated the 245 species then known from the island. This new one illustrates 248 of which 31 are endemic forms. Most are shown as live adults in natural habitat, with just a few photos of museum specimens slotted in where quality images from the field were not attained. The guidebook's small size (12 x 19 cm) and slimness (1.5 cm) makes for ease of carrying, which is a good thing. The linen embossed cover

should withstand moderate field handling, and that water-resistance that it will give should ward off some weathering in the tropics! As a synoptic piece, it will also delight both the beginner and the seasoned observer active in the broader Indian region where many of the species occur more widely. The van der Poortens are more than qualified to have authored this guide; they rose to eminence after the publication of the scholarly work, *The Butterfly Fauna of Sri Lanka* (just two years ago), to which the field guide now acts as a companion piece. That tremendous effort has indelibly



linked them into the history of butterfly research in that part of the world, and this new work more than ices the cake!

The introductory section on Sri Lanka and its butterfly fauna, once studied, will enable the reader to make the most of this book. The two maps that show the topography and the four climatic zones give insight into the mosaic distributions of the different species. For most, the species' ranges would seem to align with the elevation and the seasonal rainfall patterns of the island, with the exception of the migratory and cosmopolitan fauna (which might turn up in unpredicted places). Photos of habitats that are typical of each zone will help the naturalist to recognise the haunts of certain species in the wild. And the short precis on conservation and the re-introduction of native species into gardens and parklands reminds of that contemporary need (as a lot of habitat is now gone). Like most field guides, the common names have precedence over technical ones, yet these can vary internationally; the butterfly called the 'Blue Pansy' (p. 159), for example, will be familiar to readers in the Australian region who will know it as the 'Blue Argus'. The photo of a well-poised swallowtail feeding at a mud soak depicts the basic body parts, labelled to teach the novice. The diagrams that follow show the main regions of the wings and the wing venation (with the names of the veins and the wing spaces between them). Fluency with these terms will enable the student to recognise the characters that distinguish the different species.

The synopses of the species, which describe the sexes, give their usual size ranges and offer notes on their habits, make up the bulk of the book (pp. 24-205). These digests also cover the habitat favoured by each – adults of course can disperse widely at times, but many will remain in the areas most suited to them. The thumb-sized, plotted distribution maps include the boundaries of local shires and display just one species per map; some are inset within the text (if they fitted there), whilst the remainder is at the rear, in an appendix (pp. 206-222). The coloured spots show those reports that are historic (gained from two major sources), those reports that are from after 1950, and those reports that are in need of confirmation (because doubts exist over the accuracy of the identifications). The species' accounts may also list a few locations where the visitor could see certain kinds with good odds and include the names of flowers they often visit in those areas. Three to six images per species placed on the right-facing page opposite the text of each show the sexes and any seasonal forms of one or both alongside the underwing surfaces. All images, of which there are 1154, are of high quality and those of adults in flight (see pp. 25, 27, 161, 169, & 173 for samples) add a touch of photographic prowess. The use of arrows to point out key wing patterns of certain species will help students who are new to the island's fauna. In other places, close-ups of key identification points for some species that can be hard to identify will assist all workers. The varied activities and poses shown, such as feeding, egg laying, basking, roosting, and mating add that aesthetic touch that photos of aged, dry-pined specimens struggle to match in a book of this purpose. The Tamil Teoman (*Cirrochroa thais*), as one example, is shown laying



eggs as a concatenated ‘string’, suspended below the leaf of its host (p. 132) and so tells more of its story that way. Moreover, those sexes or whole species that look much the same are placed near each other to quicken their recognition in the field. The female of the Danaid Eggfly, for example, can be found below the Common Tiger (p. 129) which it mimics. The male of that same Eggfly (which looks nothing like the female) is, instead, below the male of the ‘Great Eggfly’ (p. 149) – a member of the same genus that it resembles (as a close genetic relative). Relevant text for the Danaid Eggfly is included in both places, as in other cases too where this layout has been adopted for the visual needs of the casual user. The accounts are fronted by precis of each of the six families that occur on the island, and these include photos of the life history for one species per family, selected as a typical example for each. And, the colour tabs in the top right hand corner of each page (which are visible on the ream when the book is closed) will allow the user to skip to the family desired, to begin identifying the butterfly once spied. The discussions of the various species are telegraphic in style; they have been clipped back to pack in as much information into the smallest number of words as possible (which the book explains). That said, good English does not demand that all sentences should be complete; hence, the careful use of shortened placenames and the excision of some verbal structures in these reviews can still offer effective communication in works of this kind.

The taxonomic keys are technical – they rely on a good familiarity with the nomenclature of wing venation and wing regions – and, so aim at the advanced student. They will ensure identification with good certainty to species (in most cases); the key to *Nacaduba* may be the exception as it is just a guide (as the text explains). A fast but reliable means of identification is important in Sri Lanka because not only do some kinds look alike (as a glance at the photos on p. 79 will show), but also because of the strict conservation laws that operate in that country. As the book states (p. 7), “... all Lepidoptera (butterflies and moths) in Sri Lanka are protected under the Fauna and Flora Protection Ordinance. *Even the use of a net for the purpose of identification and release is illegal without prior permission from the Department of Wildlife Conservation*” (emphasis added). Alas, most adults will fly away (on good chance) before one can get close to see such fine detail as may be needed to recognise the species. I can only speculate then, that identifications achieved using the keys (in the field) will be tentative ones under this prescriptive means of seeing the fauna. Taking photos of the smaller skippers and blues may help if the important wing markings are visible in the images (which may or may not be the case, as chance will also dictate). And, gaining these may be slow going and likely most frustrating without the ‘capture, chill, and release’ tactic that many keen insect photographers, with that tick-list in mind, must resort to at times. As an English poet of the eighteenth century once wrote: “Blessed is the man who expects nothing, for he shall never be disappointed” – Alexander Pope (in a letter of 1725). One could add here, that by just enjoying the ‘hunt’ (through the lens) and by adopting that ‘mindset of the moment’ (in the wilds), the visitor (with just a short time to do so) may still get some great pictures. That is, if



the weather is sunny, if the time of day is right, if adults in good condition are in close range, if the lens does not fog in the humidity, and if the battery does not go flat at that vital moment! And, yet, many times serendipity can see to that due reward (that one's effort ought to have brought at other times, and did not). As a challenge here, the females of some of the 'Line Blues' are still in need of live images (see pp. 83 & 85), so more work in the field may one day fill those gaps.

The three appendices that follow the species' accounts include most of the maps, the checklist of taxa, the taxonomic endnotes, and a list of food sources for the adults and caterpillars. A glossary, the credits for the figures and images, and the references (19 entries) then follow on. The index of both common and scientific names of the butterflies also cross-references the maps for each species. And, a snippet about the authors – we are all curious about other people's lives and their achievements – and the acknowledgements close the work.

The content has been well proof read and so there would seem to be few flaws or matters that are of editorial or scientific concern. There is a mismatch in the font size for a species name on p. 230; those legacies of auto-formatting software, where subtle changes may be made to text (that then go unnoticed). Schappert (2000), which is cited on p. 18, is not in the list of references. A citation of Pavukandy (2018), which is listed in the references, would seem to be missing from the text (at least under the species that the paper deals with). The work by D'Abrera on the island is listed on p. 230 as published in 2000 (not 1998). Given that orange and red are side by side on the colour spectrum, I wonder whether another choice of colour for the map-plots might have eased their distinction on diagrams of that small size. The main concern here is that a measure of doubt shrouds those records that are coloured orange, whereas the red ones are confirmed modern encounters; the abundance of red ones makes the orange ones harder to find too. Finally, the spelling of a nymphalid subfamily as Limenitidinae may receive a second glance by some, but it is the right one! It may come with some surprise then, that the variant in the *Zoological Catalogue of Australia* (2001, p. 329) and in the tome, *Butterflies of Australia* by Braby (2000, p. 552) as 'Limenitinae' (with yet a different misspelling on p. ix of the latter, as 'Limenitiinae') is wrong. Everybody makes mistakes, including the likes of us 'down under'!

This new handbook is all about finding and recognising the adult butterfly and so includes just the basics for the task. It more than meets the needs of its intended and varied audiences – professionals, amateurs and beginners, and it is well priced to boot. Hence, I can recommend this field guide to all who have an interest in butterflies of the South Asian region, if not just for the up-to-date treatment of the fauna of Sri Lanka that this work has aimed for, and tells of with excellence.



Blue Pansy (*Junonia orithya*)

35–50 mm. Females with blue paler and more restricted. Uncommon but occurs throughout the island in open spaces with short vegetation. Flies throughout the year in the hills; in the dry zone, commonest in July when *Crotoniaea indica*, one of its favorite larval food plants, comes into flower. Male may be seen in same location day after day patrolling a strip of its territory looking for females or chasing away other males. When disturbed, takes off explosively but soon settles down nearby. Dwarf individuals not uncommon in drier regions.

**Gray Pansy (*Junonia atlites*)**

55–65 mm. Only butterfly in the island with gray upperside. Occurs in all climatic zones up to about 700 m asl. Decidedly more partial to water than all other pansies; usually found near a stream, river, irrigation canal, marsh, seepage or tank. Habitually flies above partially submerged vegetation seeking mates or plants for egg-laying. Seldom encountered in large numbers as in the past. Visits flowers of small herbaceous plants for nectar; sometimes seen on *Dunalia* hedges in home gardens.

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[*plus \$9 AU postage and shipping].

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REPORTS**Queensland Museum Visit – 6th September 2018 – Dawn Franzmann**

Eight club members and one visitor participated in our “Back of House” tour of the Entomology Collection of the Queensland Museum.

It was a fantastic opportunity and a privilege being granted access to part of the Entomology Collection. Unfortunately, the Museum has introduced a new policy and we were not allowed to take photos of the exhibits. Our tour guide kindly took this photo of us all in the enormous lift.





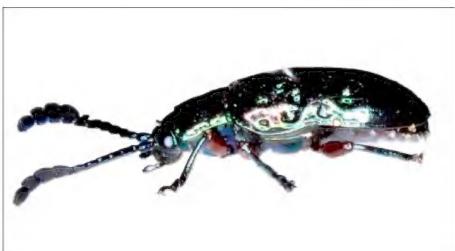
The first part of the tour was conducted by Dr Owen Seeman, Collection Manager for the Arachnida. He showed us some of the specimens in the “spirit collection” e.g. funnel web spiders, wolf spiders and a scorpion. He delivered a very interesting and entertaining talk and gave us an insight into their behaviour and habits.

The second part of the tour was the pinned insects and butterfly section. This was conducted by Dr Christine Lambkin (Curator of the Entomology Collection) and Susan Wright (Collection Manager for Insects). They had selected an interesting array of various pinned insects in display trays for us to view. Christine explained extensively the procedure the Museum carries out to preserve insects.

It was especially exciting for us all when they announced that we were to view part of the “Dodd Collection”. What a magnificent historical collection it is and we considered ourselves very lucky to view part of it. This was a special privilege for our Club.

Thank you to all who attended and the staff at the Museum who looked after us so well.

UNDER THE MICROSCOPE



The creature this time is *Johannica gemellata* (Westwood, 1849) or the Wonga Vine beetle, Chrysomelidae. They form localised populations on Wonga Vine and can be found in some Brisbane suburbs.

Photo Trevor Lambkin

BUTTERFLY AND OTHER INVERTEBRATES CLUB PROGRAMME

EXPRESSIONS OF INTEREST – BUS TRIP – MARY CAIRNCROSS ENVIRONMENT CENTRE - MALENY

A Bus trip to the Mary Cairncross Environmental Centre, Maleny, is being planned for either Wednesday 13th or Thursday 14th February, 2019. Cost for the bus varies



from \$16 pp to \$65 pp. This depends on how many people express an interest, e.g. 10-14 persons = \$65 and 48-56 persons = \$16. Family and friends are welcome.

There are guided walks through the Centre and a butterfly walk. An approximate cost for the guided walk is \$3.00. This a discounted price for not for profit organisations. We envisage that the bus would leave either from Roma Street Station or Brookside Shopping Centre. This may change dependent on where the majority of people reside. The duration of the trip would be from 8.00am to 4.00pm.

The proposed itinerary is : Leave Brisbane 8am, Mary Cairncross 10.30am to 12.30pm, lunch at Sandstone Passage Tavern 1.00-2.30pm, arrive Brisbane approx. 4.00pm. Lunch would be paid for by individuals.

Once we receive numbers of interested persons a detailed itinerary and charges will be sent to everyone.

If you are interested could you please advise Ian and Judy Ferrier, email: ian.ferrier01@gmail.com telephone: 3148 8140 or Dawn Franzmann, email: berndawn@gmail.com telephone: 3325 3573 **by 18 December, 2018.** We have to give the Centre at least 6 weeks' notice of our visit.

Planning and General Meeting

What? Our quarterly planning meetings are informative and interesting and we welcome members to contribute to discussion. The meeting will be followed by Chris Sanderson speaking on The Butterfly Australia Project.

When? **Saturday 23rd February, 2019**, commencing at 10 am. Chris will begin his talk at 11am.

Where? The EcoCentre, Griffith University Campus, Nathan

What to bring? Enthusiasm is welcome. Morning tea will be provided.

If attending, please respond to Dawn Franzmann (ph 3325 3573; 0419 786 369 or email berndawn@gmail.com)

Annual General Meeting

What? After the President's Annual Report, the election of office bearers will take place. We welcome members to contribute to discussion. The meeting will be followed by a talk on Fire Ants by Austin McLennan.

When? **Saturday 13th April, 2019**, commencing at 10 am. Austin will begin his talk after the formal meeting.

Where? Karawatha Discovery Centre, 149 Acacia Road, Karawatha

What to bring? Enthusiasm is welcome. Morning tea will be provided.

If attending, please respond to: Dawn Franzmann (ph 3325 3573; 0419 786 369 email berndawn@gmail.com)



DISCLAIMER

The magazine seeks to be as scientifically accurate as possible but the views, opinions, and observations expressed are those of the authors. The magazine is a platform for people, both amateur and professional, to express their views and observations about invertebrates. These are not necessarily those of the BOIC. The manuscripts are submitted for comment to entomologists or people working in the area of the topic being discussed. If inaccuracies have inadvertently occurred and are brought to our attention we will seek to correct them in future editions. The Editor reserves the right to refuse to print any matter which is unsuitable, inappropriate or objectionable and to make nomenclature changes as appropriate.

ACKNOWLEDGMENTS

Producing this magazine is done with the efforts of:

- Those members who have sent in letters and articles
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- Daphne Bowden who works on layout, production, and distribution
- John Moss, Kelvyn Dunn and Ross Kendall for scientific referencing and proof-reading of various articles in this issue of the magazine

ARE YOU A MEMBER?

Please check your mailing label for the date your membership is due for renewal. If your membership is due, please renew as soon as possible. **Annual membership fees are \$30.00 for individuals, schools, and organizations.** If you wish to pay electronically, the following information will assist you: BSB: **484-799**, Account No: **001227191**, Account name: **BOIC**, Bank: **Suncorp**, Reference: your membership number and surname e.g. **234 Roberts**.

Butterfly and Other Invertebrates Club Inc.
PO Box 2113
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Next Club event: Planning and General Meeting - Saturday 23rd February 2019
commencing at 10 am. See Club Programme for details.

